To: Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Behl, Betsy[Behl.Betsy@epa.gov]
From: Enck, Judith
Sent: Mon 11/7/2016 3:19:38 PM
Subject: News Clips (PFCs)

City & State NY/ First Read

MONDAY, NOVEMBER 7, 2016

TODAY'S SKED:

10:30 a.m. – Rep. Sean Patrick Maloney joins residents of Newburgh to get his blood tested for perfluorooctanesulfonic acid contamination, Harper Health, Cornerstone Family Healthcare, 290 Broadway, Newburgh.

Newsday

LI homes threatened by chemical getting municipal water hookup

Updated November 5, 2016 8:07 PM

By Joie Tyrrell

HIGHLIGHTS

- Work began Friday to connect houses near Gabreski Air National Guard base
- State, feds will pay for $2.5M in work, slated for completion in December

Work began Friday to connect Westhampton Beach homes near Francis S. Gabreski Air National Guard Base that have contaminated wells to the municipal water system, with all costs covered by the state and federal governments, state officials announced.

Fifty-seven homes with wells threatened by contamination with the chemical PFOS, or perfluorooctanesulfonic acid, will be joined to the municipal system, the state Department of Environmental Conservation said.

The U.S. Department of Defense, under a separate agreement, will cover the costs of connecting nine additional homes with well contamination that meets or exceeds federal Environmental Protection Agency health advisory levels for PFOS.

The chemical can potentially cause blood, immune system, thyroid and fetal growth issues.

The work started Friday and is expected to be complete in December. The total connection estimate is $2.5 million, the DEC said, and the Suffolk County Water Authority will be reimbursed for costs associated with the work by the state and federal governments.

The Air National Guard base was declared a New York Superfund site in September.

“DEC is working aggressively to protect the public and the environment whenever and wherever contamination is found and to hold polluters accountable for their actions,” DEC Commissioner Basil Seggos said in a statement.

In July, the DEC identified the Air National Guard base, including the former fire training area at the airport, as a potential Superfund site because of past use of firefighting foam containing PFOS.

The state agency initiated an investigation and took groundwater and soil samples at the base, and testing confirmed the site is a significant source of PFOS contamination in the area, officials said.

In late July, Suffolk County collected samples from 66 private drinking water wells in Westhampton Beach and found that several were contaminated. Of the wells sampled, those of nine homes were found to have PFOS contamination that met or exceeded the EPA’s threshold of 70 parts per trillion. Samples from three wells detected levels of PFOS below the EPA threshold.

The cleanup effort includes approximately 57 residents with private wells that currently do not exceed the contamination threshold but are threatened in the future.

DEC officials said the state has worked closely with Suffolk County and the Suffolk County Water Authority to inform residents and ensure they have access to bottled water and that they are quickly connected to the municipal water supply.

Discovery of the groundwater contamination near Gabreski Airport came after the state’s Water Quality Rapid Response Team, created by Gov. Andrew M. Cuomo, analyzed data from the EPA’s Unregulated Contaminant Monitoring Rule program to identify potential areas of contamination statewide.

The DEC in April added PFOS to the state’s list of hazardous substances, meaning that state Superfund money could be used to address such contamination.

When the agency formally declared Gabreski Air National Guard Base a Class 2 Superfund Site in September, the designation identified the Defense Department, which oversees the site’s operations, as the potentially responsible party for PFOS contamination detected in nearby groundwater supplies.

“We look forward to connecting residents impacted by PFOS with public water from SCWA that is constantly tested and meets health standards,” said Jeffrey W. Szabo, CEO of the Suffolk County Water Authority.

PHOTO In July, the DEC identified the Gabreski Air National Guard base, including the former

fire training area at the airport, as a potential Superfund site. Photo Credit: Kevin P. Coughlin

The Intelligencer

Determining safe PFOA level an uncertain science

By Kyle Bagenstose and Jenny Wagner, staff writers

41 min ago

Typically, scientists don't air their grievances against one another publicly. They stick to the facts and let the peer review process ferret out the truth.

But the New Jersey Department of Environmental Protection's Drinking Water Quality Institute bucked that tradition in a PowerPoint presentation on its recently proposed PFOA drinking water limit.

The target? The Environmental Protection Agency's 70 part per trillion (ppt) advisory limit for PFOA.

"It cannot be concluded that exposure to (70 ppt) is protective of the most sensitive populations with a margin of exposure," the institute's report stated.

In other words, the amount of PFOA the EPA says is safe for millions of Americans to consume in drinking water actually is not, according to the institute, a state-appointed group of health and technology researchers tasked with recommending drinking water limits for contaminants in New Jersey.

In its presentation, the institute leveled several criticisms against the EPA's limit, including:

- The EPA didn't account for possible health effects -- such as liver toxicity, delayed development and decreased immune response -- that may occur at low levels of exposure.

- The EPA underestimated the cancer risk of the chemical.

- The EPA's advisory doesn't adequately protect women who plan to become pregnant.

- The EPA came to illogical scientific conclusions during its development of the 70-ppt advisory.

On Oct. 14, this news organization sent a series of questions to the EPA, asking the agency to explain the science behind its 70-ppt advisory and offer any responses to the New Jersey institute's criticisms. On Friday afternoon, the agency responded with several pages of technical answers that require substantial review and fact-checking. A separate story will be published when that is completed.

In late summer, the New Jersey institute recommended a drinking water limit of 14 ppt for

PFOA, just one-fifth of the EPA's. But even that may not be totally protective, according to the institute.

“Substantial evidence indicates that PFOA may cause human health effects … even without (any) additional exposure from drinking water,” the institute reasoned in its presentation, adding PFOA also enters human blood through routes other than drinking water, including through products that contained it or by eating foods such as fish in which PFOA and related chemicals such as PFOS can accumulate.

PHOTO Dr. Keith Cooper, chairman of the New Jersey Department of Environmental Protections's Drinking Water Quality Institute, delivers a presentation on the institute's recommended 14-ppt limit for PFOA in drinking water in Ewing Township, New Jersey. The 14-ppt limit is a fifth of the limit recommended by the EPA, which the institute criticized as too high.

Kyle Bagenstose/Staff

If the institute is correct, the implications are massive. PFOA and PFOS have been found in the drinking water supplies upon which millions of Americans rely. Studies show they could cause everything from elevated cholesterol to cancer, with some effects occurring at low doses.

The EPA spent the better part of a decade researching the chemicals before releasing the 70-ppt recommended limit, which can be used for the chemicals individually or combined, in May 2016. The agency has said it is the absolutely safe level for all people -- even infants, the elderly and the ill -- in meetings with concerned communities nationwide, including in the Delaware Valley.

PHOTO (File photo) Karen Johnson, of the Environmental Protection Agency, was part of the panel that discussed the health issues surrounding the contaminated water in wells in the communities of Horsham, Warrington and Warminster at a forum at Hatboro-Horsham High School on Monday, Aug. 29, 2016. Johnson told residents there that the EPA's 70 ppt advised limit for PFOA and PFOS was safe for all individuals.

Art Gentile/Photojournalist

“It’s a very conservative, very protective value,” Karen Johnson, chief of the groundwater enforcement branch of the EPA’s Region III office in Philadelphia, said at a packed town hall meeting in Horsham in August.

The military, as well as federal and state agencies like the Pennsylvania Department of Environmental Protection, also use the 70-ppt advisory as their de facto limit, espousing faith in the EPA’s review.

But if Pennsylvania were to shift from a 70-ppt limit to a 14-ppt limit, that would appear to make a significant difference in how the contamination is addressed, particularly in Bucks and Montgomery counties. Although PFOS often is found in higher levels in the area, tests on a number of area public water wells currently in operation have found PFOA above 14 ppt, including in Bristol, Buckingham, Hatboro and Upper Dublin.

Perhaps most significantly, water entering Aqua PA’s Neshaminy Creek Plant in Middletown, which serves about 38,000 people, has tested above that level, although water leaving the plant

has tested slightly below.

PHOTO

(File photo) This water has gone through an early filtration process at Aqua PA's Neshaminy Water Treatment Plant in Middletown. The plant draws about 11 million gallons a day out of the Neshaminy Creek to serve customers in Bucks and Montgomery counties. Water from the facility has flirted with the 14-ppt safety level the NJDEP Drinking Water Quality Institute has proposed for water systems in New Jersey.

Kim Weimer / Photojournalist

While the two chemicals haven't been found at any levels in water supplies in Burlington County, New Jersey, PFOA has been found at some level in nearly two-thirds of 72 water systems that have been tested statewide, according to the drinking water institute.

At least 22 of those systems -- about 30 percent -- would exceed the 14-ppt level. That means the dispute between the EPA and the institute's proposed limits has implications for the safety of drinking water for at least several hundred thousand New Jerseyans. The cost of filtering all those additional water supplies also could be gigantic; in Pennsylvania, the bill to get the water of just three water authorities below 70 ppt was about $20 million.

On the surface, the EPA and institute's analyses appear to have much in common. Both were developed in a similar time frame, reaching back from before President Barack Obama took office to their 2016 release. And both involved the reviews of hundreds of studies of potential health effects, including many of the same studies.

But in midst of that mountain of material, it turns out there were just a few important distinctions that could have ramifications for the health of millions.

Of mice and men

Determining the safe level of a chemical is an extremely complex endeavor. Uncertainty is baked into the process and regulators have different views on how to account for risk. The door is left open for discrepancies, such as the one seen for PFOA.

Small mammals like mice, rats and monkeys often are the preferred subjects of regulators when determining safe levels of a substance. That's because they can be experimented on in a controlled way and given higher and higher doses until health effects start popping up, and that experiment can then be replicated. This is the basis of the field of toxicology.

PHOTO A pair of lab rats used during research into the health effects of PFOA on offspring. The 2011 study found delays in mammary gland development from any level of exposure, and was key in the NJDEP's Drinking Water Quality Institute's decision to recommend a 14-ppt limit for the chemical. CREDIT: Environmental Health Perspectives journal.

Photo by Environmental Health Perspectives journal

Humans are a trickier endeavor, because research has to be retrospective; scientists must look backward to determine what exposure levels may have been and then attempt to link them to

health effects. Exposures to other chemicals, counter-intuitive health effects, and even random chance can all throw off findings. This is the field of epidemiology.

In both fields, mathematical tools called uncertainty factors -- or UF in scientist shorthand -- are used to account for unknowns. A UF of 10 often is applied to create a safe level for humans from a safe level for an animal, because they are biologically different. For example, if a regulatory agency finds that 100 ppt of a chemical per ounce of body weight was safe for mice, it may set a level of just 10 ppt for humans to account for that uncertainty.

Uncertainty factors can be applied in different ways, however, which is why the water institute and the EPA drew different conclusions on PFOA.

Both initially arrived at a similar safe dose amount for PFOA. The institute referenced a study that found a 10-percent increase in liver weight among mice -- a condition that impairs liver function -- occurred at a certain level of exposure. After adding some uncertainty factors to account for differences in humans, it came up with a safe daily dose of the chemical.

The EPA actually arrived at the same dose, although it referenced a study that found delayed bone development and delayed puberty in mice.

But the New Jersey institute was troubled by something else. Another study, conducted in 2011, found developmental delays in the mammary glands of female mice that were exposed to even smaller amounts in the womb. Suzanne Fenton, a research group leader at the National Institute of Environmental Health Sciences who directed the study, said analysis showed some delays in mammary gland development occurred no matter the dose level.

Ultimately, the study concluded "chronic, low-dose PFOA exposure in drinking water" altered mammary gland development in mice.

Suzanne Fenton, a research group leader at the National Institute of Environmental Health Sciences, directed a 2011 study on rat offspring that found some delays in mammary gland development occurred no matter the dose level of PFOA.

Courtesy of Suzanne Fenton

Fenton said healthy mammary gland development is important not only to ensure a mother's ability to breastfeed, but also because delayed development could potentially increase the risk for cancerous tumors. That's because biological structures called terminal end buds, which play a key role in development, contain stem cells that are sensitive to the effects of environmental carcinogens.

"Those are structures that are most susceptible to a carcinogen," Fenton said. "You don't necessarily want those to be there for a long period of time."

Citing research from Fenton's team, the institute determined a safe drinking water level for humans would be just 0.77 ppt of PFOA, a level so low current tests can’t even detect it.

The institute presentation stated there is “no precedent” for the use of delayed mammary gland development in the creation of a drinking water standard. But coupled with similarly concerning studies, it decided to account for the risk by applying an extra uncertainty factor of 10, arriving at

its recommendation of 14 ppt as a safe limit for PFOA.

The EPA would have arrived at a recommendation of 140 ppt, but it increased the amount of water it presumed a typical person drinks, in order to protect pregnant or lactating women, who may drink more water. That brought it down to the EPA's current 70 ppt level for PFOA.

In its presentation, the institute charges that the EPA's "reasons for dismissing mammary gland effects at low doses of PFOA appear to lack scientific validity."

Asked which agency she agreed with, Fenton did not name one or the other. Instead, she said any regulator setting out to develop a safe level of PFOA would be "wise" to place emphasis on developmental effects.

"The strongest data that have been published show consistent effects of PFOA that persist into adulthood following a developmental exposure," Fenton said.

Krystal Fleisch, a Warwick resident who drinks water from a private well, is one local mother who's concerned with how the chemicals could affect the health of her four children.

A woman from the EPA knocked on Krystal Fleisch's door in May, about a month after she gave birth to her youngest child, and told Fleisch their water was unsafe to drink.

Tests later showed their private well contained 58.7 ppt of PFOA and PFOS, not far below the EPA's 70-ppt advisory limit. Fleisch said the Navy later told her family the EPA read the results incorrectly. However, they still receive bottled water deliveries from the agencies.

Fleisch said the uncertainty surrounding the situation and the health effects of the chemicals scares her. And she wonders if they could have played a role in the five miscarriages she's endured. Her parents, who live in Warminster, both developed cancer, she said.

But it's the health implications for her children that scare her the most.

"I am trying to provide what I think is the best by breastfeeding my children," she said, noting that she wants government blood tests to see if she's passing any amounts to her infant.

Murky waters

The agencies didn't just reach different conclusions on risks to mammary glands, but also on testicular cancer.

According to its presentation, the New Jersey institute studied a variety of cancer data, and from a study on rats, it determined the 14-ppt drinking water level represented a one-in-a-million risk of testicular cancer for humans. So, if a million men drank water contaminated at 14 ppt of PFOA for their entire lives, one would be expected to develop cancer.

Since scientists say there is no safe amount of any carcinogen, a one-in-a-million risk typically is viewed as acceptable for regulatory purposes.

To arrive at the 14-ppt level, the institute said it had to account for differences in how quickly

humans and rats get rid of the chemicals from their bodies. Since that takes longer for humans, they would need to consume proportionally less on a daily basis to avoid health effects, the institute reasoned.

The institute charged that the EPA didn't account for this difference when analyzing the cancer risk, despite using it while studying non-cancer health effects.

"(EPA's) approach for cancer evaluation does not appear to be logical or consistent with its non-cancer evaluation," the institute's presentation stated.

If the institute's criticism is correct, it would mean the EPA's 70-ppt level is five times less protective of cancer risks than typical standards call for.

Blood levels

But the institute's strongest worded criticism of the EPA was directly relevant to one of the key friction points for residents of Bucks and Montgomery counties: what, if anything, blood tests for the chemicals can reveal.

Through a review of available research, the New Jersey water institute determined that drinking water contaminated with PFOA will lead to anywhere from a 100- to 200-fold increase of the chemical in human blood, depending on the exact study and how much water an individual consumed on a regular basis.

In other words, drinking water with 10 ppt, after some period in time, would lead to at least 1,000 ppt in a human's blood.

Given such significant increases, the institute noted that human studies showed health effects may occur even from small amounts of exposure in drinking water. One such study, by epidemiologist Kyle Steenland, found small but measurable changes in cholesterol could have been caused by low levels of exposure.

Using the same reasoning, the institute concluded that drinking water containing less than 70 ppt of PFOA also could result in decreased vaccine response, lower birth weight and liver toxicity.

On the other hand, the institute stated, the EPA "does not acknowledge that the increase in (PFOA blood levels) from ongoing exposure … can be easily predicted," and the EPA "does not consider (blood levels) or drinking water concentrations associated with these health effects."

The institute presentation poses the EPA's stance as puzzling, since the EPA developed an equation that predicts the rate at which the human body gets rid of the chemical -- called a clearance factor -- and used it in the development of its health advisory.

In other words, if the EPA was comfortable predicting how much PFOA the human body can get rid of on a daily basis, why couldn't it just subtract that amount from the body's intake and predict how much would remain?

The institute hammered the EPA on that point, concluding that "use of clearance factor to predict increased (blood levels) from drinking water exposures is technically sound and is not

subject to debate."

Regardless of how much PFOA and PFOS accumulate in the blood from drinking water, German regulators -- like the institute -- are concerned about any extra amount. Germany's Human Biomonitoring Commission, a group within its main federal environmental agency, released an analysis in October that set blood level targets of 2 ppb for PFOA and 5 pbb for PFOS; amounts already exceeded in the blood of average Americans.

Any elevation of PFOA and PFOS above those levels in blood, the commission's report stated, risks negative health effects, including low birth weight, decreased immune response to vaccines, and impaired hormonal development and thyroid metabolism.

According to Perry Cohn, a retired environmental health epidemiologist for the New Jersey Department of Health, the implication is that average Americans may already be at risk of adverse health effects because of the amount of PFOA in their blood; about 2.08 ppb. Any additional exposure from drinking water would just pose an increased risk.

"(The German levels are) about the same as the median level for these chemicals in the general population, as measured by the CDC," Cohn wrote in an email. "The implication is that no additional PFOA or PFOS should be ingested."

The most vulnerable

At the end of its presentation, the institute took one more shot at the EPA's 70-ppt advisory limit. While the EPA's advisory states it is protective of vulnerable people such as pregnant and lactating women and bottle-fed infants, the institute critiqued the agency on its exclusion of women who plan to become pregnant.

That's a problem if the work of a group of California researchers, led by Tracey Woodruff, is correct.

In 2014, Woodruff, an environmental health researcher at the University of California, San Francisco, and her team released a systematic review of 18 studies on the effect of PFOA on human birth weight. Systematic reviews often are considered the gold standard of epidemiology research, since they evaluate the strength of studies and then average the results.

The review determined that every 1,000 ppt increase of PFOA in the blood of a pregnant woman was associated with a decrease of 2/3 of an ounce in birth weight. If the institute's ratio of at least 1-to-100 for drinking water to blood levels is correct, that would mean a mother exposed to 60 ppt of PFOA in her drinking water -- within the EPA's recommended safety limit -- could be at risk of giving birth to a baby about 4 ounces lighter than would have been expected.

But the situation gets worse when taking into account other factors. For one, the average American already has approximately 2 ppb of PFOA in their blood, risking the loss of an additional 1.5 ounces.

Woodruff told this news organization her research team concluded that if the amount of PFOA in highly exposed Americans was reduced by about 3 ppb, it could possibly prevent as many as 40,000 babies a year from crossing the threshold into being born at a clinically low birth weight, which has health implications.

The concern could be greater locally. Prior to public well closures in 2014, levels of PFOS and PFOA reached into the thousands of parts per trillion. The water from those wells mixed with water from other wells, making it difficult to determine exactly how much of the chemicals residents were exposed to, but private wells wouldn't have benefited from such dilution.

The studies reviewed by Woodruff's team didn't analyze effects of very high exposures. Woodruff said there is still a lack of research on those populations.

But, if the effect on birth weight continues into higher exposure levels, it's possible some future mothers in Bucks and Montgomery counties could be walking around with enough PFOA in their blood to significantly lower the birth weight of future offspring. But they wouldn't know it, as a public blood testing program hasn't been conducted.

In a draft toxicology report on PFOA last year, the U.S. Agency for Toxic Substances and Disease Registry wrote that "there is evidence to suggest that high serum PFOA or PFOS levels are associated with lower birth weights." But, the agency concluded that "decreases in birth weight were small and may not be biologically relevant."

On Oct. 14, this news organization sent a series of questions to the ATSDR, including a request for comment on how it squared Woodruff's findings with its statement. A response was not received by press time.

A history of exposure

Concerns over the chemicals' effects on birth weight highlight another issue with the EPA's advisory: if PFOA and PFOS do accumulate in blood, is it appropriate to use the 70-ppt limit for large populations that were already exposed to the chemicals at much higher levels before the limit went into effect, such as those in Bucks and Montgomery counties?

That's another reason why blood testing for such populations may be a good decision, said Laurel Schaider, a research scientist at Silent Spring Institute, a Massachusetts-based organization that studies water quality and environmental toxins.

Shaider said that it's difficult to assess what contamination sources lead to PFOA in the blood of an individual, but that it's reasonable to "suspect" highly contaminated water could play an outsize role.

"What that percent is in reality depends a lot on what your day-to-day environment looks like and the levels in your drinking water," she said.

The EPA's Karen Johnson made no reference to this point when she addressed hundreds of concerned citizens at the community meeting in Horsham last summer. She stated that because the EPA's 70-ppt limit accounts for 80 percent of exposure to PFOA and PFOS from other sources, the threshold is extra protective.

"The health advisory is currently based at 20 percent of our consumption is from drinking water. The other 80 percent … is from toothpaste, cosmetics, dust, rug-associated stuff," Johnson said. "So therefore, it's a very conservative, very protective value, for the health advisory."

Many residents of Bucks and Montgomery counties already have decided they don't want any additional exposure to PFOA or PFOS. An online petition calling for the state Department of Environmental Protection to set a drinking water regulation at non-detectable levels -- or about 2 ppt for each chemical -- has amassed more than 2,000 signatures.

Responding to such concerns, water authorities in Horsham, Warminster and Warrington also have set out to remove the chemicals entirely from their systems, even though the costs being footed by their customers range into the millions of dollars.

PHOTO (File photo) The granular carbon water filtration system installed on Warminster's well 10 in October. Filtration systems like this one will be key in implementing plans in Warminster, Horsham, and Warrington to remove PFOA and PFOS entirely from their water systems.

Bill Fraser / Photojournalist

But what about the Pennsylvania DEP? According to Virginia Cain, DEP's community relations coordinator, the agency hasn't set its own drinking water regulation for any contaminant since the creation of the state's Safe Drinking Water Act 32 years ago. And the agency doesn't employ any staff with the expertise to research a safe limit for PFOA or PFOS, as New Jersey's department has done.

"PA DEP does not currently have the resources, funding, or staff to develop an enforceable (standard)," Cain wrote in an email, adding that very few states do.

That means the possibility of a Pennsylvania standard for PFOA and PFOS likely rests with a bill proposed by state Rep. Tom Murt, R-152, of Upper Moreland. Introduced earlier this year and currently sitting in committee, the bill would create a 5-ppt limit for each chemical. Not only would be it be the lowest action limit proposed anywhere in the U.S., it also would be the only official state or federal standard.

Murt said in October he anticipates the bill will be brought up for discussion sometime early next year. But even if it's approved by the Legislature and signed into law by the governor, its fate would remain to be seen. In Vermont, a state agency set an interim standard of 20 ppt for both chemicals, which is double Murt's proposal, and was quickly sued by manufacturing company Saint-Gobain.

The company's claim? That the 20-ppt limit isn't supported by science.

PHOTO Art Gentile / Photojournalist

Krystal Fleisch, of Warwick, with her children, Tanner, 7 months, and Kellen, 3. Fleisch has been using bottled water to drink and cook with since being told by the Navy and the EPA her household's private drinking well water contains PFOA and PFOS.

PHOTO Airman 1st Class Dennis Sloan/U.S. Air Force

(File photo) Airmen and Marines battle a fire surrounding a mock aircraft frame June 10, 2011, during a joint firefighting course at Joint Base McGuire-Dix-Lakehurst. Although water was used in this drill, historically firefighting foam containing PFOS was used instead. Although PFOS and PFOA have not been detected in any Burlington County water supplies, sampling has found the

chemicals are widespread in other water systems throughout the state.

PHOTO Hans Pennink/for the Bucks County Courier Times

Exterior view of the Saint-Gobain Performance Plastics plant under investigation by New York regulators for contamination of the town's drinking water in Hoosick Falls, New York.

CHART: Levels of uncertainty

Citing a number of studies, the NJDEP's Drinking Water Quality Institute says PFOA levels in drinking water will lead to at least a 100-fold increase of PFOA levels in blood. If so, the chart below demonstrates how PFOA in water (in parts per trillion) will lead to PFOA in blood (in parts per billion). One part per billion equals 1,000 parts per trillion.

GRAPHIC: In 2014, a group of California researchers, led by Tracey Woodruff, analyzed multiple studies on the effect of PFOA on birth weight.

They found that at exposure levels common to the U.S. population, each part per billion of PFOA in blood will lead to two-thirds of an ounce in decreased birthweight.

Using the group's calculations, and the NJDEP's ratio of water-to-blood accumulation, the babies here represent the birth weight risk for mothers consuming water at the limit of the different advisory levels.

CHART: PFOA and Cholesterol

C8 Science Panel researcher Kyle Steenland analyzed the potential effects of PFOA exposure on cholesterol levels. The chart below, from a 2009 study by Steenland, approximates predicted increases in total cholesterol from blood levels of PFOA. As 200 mg/dL is considered the limit for healthy cholesterol, Steenland's research suggests the presence of PFOA in the blood, even at low levels, could make a difference for health.

QUOTE: We made our probable link based on that cross-sectional data but also, at least as important, if not more, the longitudinal study of high cholesterol we did.

-- Kyle Steenland, C8 Science Panel researcher

Video: The case for blood testing

23 hrs ago

Across the country people affected by PFOA and PFOS drinking water contamination say blood tests offer them answers, even though health effects aren't certain. Bucks and Montgomery residents say they want answers, too.

http://www.theintell.com/news/horsham-pfos/video-the-case-for-blood-testing/html_d433e2b3-4c54-5400-8478-29ab0ffb6439.html

The Intelligencer

The case for public blood tests for PFOA and PFOS

By Kyle Bagenstose and Jenny Wagner, staff writers

Nov 6, 2016

The envelopes arrived in Rob Allen's mailbox in Hoosick Falls, New York, on June 6. There were six in all: one for Allen, one for his wife, Heather, and one for each of their four children, now 10, 7, 5 and 2.

They carried the results of the blood tests the state announced earlier in the year for all the residents of the upstate Hoosick area after the toxic compound PFOA was found in their drinking water about two years prior. The contamination has been traced to a nearby manufacturing plant owned by Saint-Gobain, a plastics and materials company.

Allen opened his envelope first. It showed his blood contained 50 parts per billion of PFOA, about 25 times that of the average American. It took him by surprise.

"I didn't think I'd be that high. A lot of the water I drank was in the school and the school ended up testing fine, which was a great, great relief," Allen said.

His wife's results showed much less of the chemical, and was just above the national average of about 2 ppb.

But their relief turned to shock when they opened their children's envelopes. Three of the four had blood levels higher than Allen, led by their then almost 2-year-old daughter, who had more than 100 ppb.

They realized Heather's levels probably were so low because she passed the chemical to the children during pregnancy and through breastfeeding, an effect well documented by scientific studies.

"The choices we made for the healthiest possible children were trumped by the fact that all of this stuff happened (and) we had no idea," Rob Allen said.

PHOTO

Hoosick Falls, New York, residents Will Clifford, 16, and his mother, Heather Clifford, discuss the village's water contamination in February 2016, at the HAYC3 Armory, a community center there. The Cliffords had their blood drawn for PFOA testing through the state's Department of Health.

Courtesy of Cindy Schultz/Times Union

Despite that “earth-shattering” conclusion, he said the test results have been invaluable to the family as they try to understand the implications of having the mysterious, unregulated chemical in their bodies. They’ve taken to doing their own research into existing studies on possible health effects.

"We just really need to know in terms of the future what we need to expect. We need to know that I have to keep an eye on liver, thyroid issues, in particular, at certain ages," Rob Allen said, adding that other studies have shown PFOA can also suppress children's immune systems.

Rob Allen’s outlook conflicts with statements made by federal agencies to residents of Bucks and Montgomery counties, who are faced with similar drinking water contamination of PFOA and PFOS. Because research into the health effects of the chemicals is still developing, those agencies have said blood tests wouldn’t be helpful to residents.

In a July letter responding to local lawmakers who requested the Navy fund a blood testing program in Bucks and Montgomery counties, Assistant Secretary of the Navy Steve Iselin declined to pursue the matter after consulting with the U.S. Agency for Toxic Substances and Disease Registry, the federal agency typically tasked with conducting such assessments.

"ATSDR does not recommend blood testing for several reasons," Iselin wrote. "First, the test results are not clinically interpretable; that is, they will not help individuals or their physicians determine if current or future health problems are related to PFOS or PFOA, or guide treatment plans."

Then in August, at a packed town hall meeting in Horsham, Karl Markiewicz, a senior toxicologist with the ATSDR, answered health concerns from a former military firefighter by saying there was little a doctor could test for due to the exposure.

“Is there a clinical test or is there a clinical symptom that (a person) could look for or tell (their) doctor to look for? I mean there really isn't," Markiewicz said.

The stance by federal officials has implications for at least 70,000 people in the area that is at the heart of contamination here, not including past residents or those in neighboring communities.

Allen said he heard similar statements in response to Hoosick area residents’ requests for blood testing.

“Most groups are going to be reluctant to do anything about it … to open up the can of worms which is blood testing,” Allen said. “They're going to say, 'Look, the number's not conclusive, we don't know exactly what's going to happen.' And that's nonsense, because we don't have to know exactly what's going to happen.”

Laurel Schaider, a research scientist for the Silent Spring Institute, a Massachusetts-based organization that studies water quality and toxins, acknowledged officials can be reluctant to order testing when scientists don't know what blood levels mean.

"But we find that people do want to know, and you can explain to them -- even if there's no guideline -- here's how you compare to the rest of the U.S. or maybe compare to other residents at this particular site, and that's helpful for them," Schaider said.

"And sometimes the answer is that they have been exposed to a high level and they find that helpful to know, even if that's disturbing information to have," she added.

From a health care perspective, blood testing is important to determine future risk and future health screenings, said Eileen Van Parys of New Britain, a semiretired cardiovascular clinical specialist nurse with a doctorate in health education. She likened it to diabetes or high cholesterol.

"Knowing the exposure gives you a leg up on diagnosing or expecting something possible in the future," said Van Parys, who has been fighting for blood testing for her family members who live in Warminster.

Armed with the information, Allen agreed he and his doctors can watch for some of the ailments associated with the chemical compound.

"I need to know that if I'm in the hospital I can also say, 'Hey, please do an ultrasound of my liver to see if I have a growth, or my kidney,' " Rob Allen said.

PHOTO (File) Hundreds of people who think they may have been affected by drinking water contaminated with perfluorinated compounds turned out in late June 2016, at Upper Moreland High School to gather information and hear from lawyers with Weitz & Luxenberg PC , a New York City law firm.

Kim Weimer/photojournalist

He is not alone in that view. From New York to New Hampshire and from Ohio to West Virginia, people affected by the growing national crisis of PFOA and PFOS have told this news organization that blood tests empowered them to start making sense of their exposure. And some said it was the first step toward justice and financial compensation.

PFOA, along with PFOS, is ubiquitous in the modern world. The chemicals were used in Teflon pans, non-stick coatings, pizza boxes and products like firefighting foams, meaning they are widespread in our daily environment, and in many cases, our drinking water.

At the very least, Schaider said, blood testing results also can get people to start thinking about how to avoid some of those additional exposures.

In the Hoosick area, the blood of more than 2,000 people has been tested by the New York State Department of Health. Overall, blood tests have shown an average of about 23.5 ppb. But for those like Rob Allen, who drank from the most contaminated water source -- the public supply -- the level was 55 ppb.

That compares to a level of just 2.08 ppb for the average American, according to a nationwide testing program administered by the U.S. Centers for Disease Control and Prevention. The level of PFOS for the average American is 6.31 ppb. While PFOS wasn't found in significant amounts in Hoosick, it was found in higher amounts than PFOA in Bucks and Montgomery counties.

PFOS at Pease, New Hampshire

In 2014, PFOS was found in a drinking water well serving the Pease Tradeport and the New Hampshire Air National Guard Base. Contamination there is similar to that of Bucks and Montgomery counties, as PFOS was the contaminant found in higher levels and was suspected to have come from firefighting foams used at the joint military-public facility.

PHOTO

Andrea Amico of Portsmouth, New Hampshire, started the group Testing for Pease to help advocate for blood testing for toxic compounds in the water at the Pease Tradeport.

PHOTO Andrea Amico's husband worked at the tradeport and she had two kids in the facility's day care. The Portsmouth resident immediately began researching perfluorinated compounds, and said she believes state and local officials downplayed the situation at an initial public meeting.

"It was very much like, 'We don't recommend blood testing and we don't think that the science is conclusive about health effects.' And, you know, 'The well has been shut down so everything will be OK.' " Amico said. "That just didn't sit well with me."

When she talked with her pediatrician, she learned that the blood testing wasn't something she could simply get a lab slip for.

"He said, 'Yeah, I think a blood test would be a good idea to establish a baseline so we know what levels they have in their bodies,'" Amico recalled.

Amico began advocating for blood testing, at first for her family, and then later for the entire community with the help of two other local mothers. In 2015, the New Hampshire Department of Health and Human Services and ATSDR worked together to provide blood testing for approximately 1,600 people.

The results showed statistically elevated levels of several of the chemicals: on average, people had about 8.59 ppb of PFOS in their blood -- 36 percent higher than the average American. For PFOA, the average was 3.2 ppb -- about 48 percent higher.

In addition, the blood testing found that 124 people, about 10 percent of those tested, had PFOS levels above 21.7 ppb -- the 95th percentile for nationwide levels. And levels of PFOA for children were worse: 19 percent had statistically high levels of PFOA, about four times the national average.

PHOTO Exterior view of the Saint-Gobain Performance Plastics plant in Hoosick Falls, New York. The company is under investigation by New York regulators for suspicions that it contaminated the town's drinking water.

Hans Pennink/for the Bucks County Courier Times

The Pease testing program, completed last summer, was the first nationally to examine the blood of a large population of people primarily exposed to PFOS. Perhaps for that reason, the ATSDR's Karl Markiewicz remarked at the August meeting in Horsham that residents of Bucks and Montgomery counties might find similar results of PFOS in their blood.

"I think the same thing that we see at Pease is that same thing that we would see here if we did a biomonitoring-type study," Markiewicz said.

Van Parys disagreed, based on her experience as a clinician.

"I've kind of learned in nursing that you don't assume that the product will be the same or that the same thing is going to happen," she said. "You never really know in health care."

Markiewicz also seemed to downplay the results of the Pease study, suggesting that while statistically elevated, the blood levels were "certainly way lower than the high or very high levels" seen in other exposed populations.

"We don't really understand what (the Pease levels) means for public health," Markiewicz said.

But an analysis by this news organization found significant differences in exposures at Pease and locally, and that residents here could have had greater exposures to PFOA and PFOS, even though the amounts of the chemicals in the water at Pease likely was greater.

According to information posted by the city of Portsmouth, New Hampshire, the main Pease well was contaminated with about 2.85 ppb of the chemicals in 2014. Even after factoring in other water sources, this news organization estimated tap water at Pease would have averaged about 1.17 ppb of the chemicals just before the contaminated well there was taken offline.

Warminster was the most widely affected residential water system locally. Using the highest PFOS and PFOA levels ever found in each well in Warminster and adjusting for how much water each of the system's 19 water sources were providing in 2013, this news organization estimated that levels would have reached about 0.176 ppb.

That's only about 15 percent of the level in Pease, although it's more than double the EPA's health advisory of 0.07 ppb (70 parts per trillion) for drinking water.

But local people were likely drinking more water for longer. According to an analysis by the New Hampshire Department of Health and Human Services, the Pease blood testing program included "any person who worked on, lived on, or attended child care on Pease and consumed the contaminated water or who consumed water from a contaminated private drinking well in proximity to Pease."

Amico noted that there are no homes on Pease, which was redeveloped as an industrial and business park in 1991. Instead, the exposed population mainly consisted of commuters, children in two day care centers and people in the service who commuted to the active air reserve station.

A state analysis of the individuals tested showed the average person in the blood testing program spent six and a half years at Pease. Nearly 40 percent spent less than four years there.

Only two of the people tested reported having a contaminated private well, whereas more than 150 wells have been contaminated in Bucks and Montgomery counties at levels above what the EPA considers safe.

And of those at Pease who answered the question on the testing program questionnaire, about 83 percent reported consuming less than two liters of water a day from the facility, which is the amount consumed daily by the typical American. The statistic suggested a vast majority of the residents split their water consumption between on-base, contaminated sources and other sources.

“At Pease, the exposure was mostly through people going to work and drinking water at work, or children drinking water at their day care … their consumption might be less because it was only when they were at school or work,” said Schaider, who also is a technical adviser for the Pease community assistance panel that helps guide the ATSDR’s work there.

Finally, while PFOA and PFOS levels in Pease tap water may have been higher than they were for the affected local area, they weren't higher than the levels found in the Horsham Air Guard Station supply in 2014. Tests there showed PFOS at 11.9 ppb and PFOA at 3.28 ppb -- more than five times the levels found in the most contaminated Pease well, which also was diluted by other water sources.

Like other residents in Bucks and Montgomery counties, the men and women serving their country at the air guard station still have no idea how much of the chemicals entered their blood.

Truth serum

Attorney Rob Bilott, of Ohio’s Taft Stettinius & Hollister law firm, said blood testing can offer much more than just basic information to residents exposed to PFOA and PFOS.

For the past 15 years, Bilott has represented residents of six water districts in the Mid-Ohio Valley in a massive class-action lawsuit against DuPont, after PFOA was found to have entered their drinking water from DuPont's Washington Works, a manufacturing plant along the Ohio River.

Bilott’s court victories won blood testing for some 69,000 residents in Ohio and West Virginia. But it was the extra scientific step that occurred there, which has not yet occurred in Hoosick or Pease, that started Bilott on a journey that may outlast his lifetime.

As a result of the class-action suit, a court ordered DuPont to pay more than $100 million to fund the largest human study on the health effects of PFOA to date, the C8 Science Panel.

"The agreement -- the way we set it up -- was very unique. ... I don't think there'd been an agreement like that before," Bilott said, adding that DuPont was legally forbidden from contesting the findings of the study in subsequent personal injury suits.

Researchers spent several years reconstructing how much PFOA people in the six water districts were believed to have been exposed to, and thus, how much PFOA would be in their

blood. Blood samples were taken, and for the most part, the results lined up.

Researchers found median blood levels of 28 ppb for PFOA, meaning half of those sampled were above or below that amount. But the average blood level was 82 ppb, suggesting the most exposed individuals had extremely high levels of the chemical, and the median level in the most contaminated community was 224 ppb. The researchers then spent several more years analyzing whether those blood levels were linked to diseases.

Bilott admitted there was some public frustration at the pace of the studies. "We even had, at one point, hearings with the court to look into whether or not steps needed to be taken to force the panel to move quicker," Bilott said.

When the study results began to arrive seven years later, the researchers had found “probable links” to “high cholesterol, ulcerative colitis, thyroid disease, testicular cancer, kidney cancer, and pregnancy-induced hypertension.”

Stunned, Bilott urged regulators to act swiftly on the chemicals, and shared the findings of studies suggesting that allegedly "safe" levels were too high.

"We sent letters to the EPA and to other state and federal agencies dating back to 2001, asking them to get involved and do whatever needed to be done to get people on clean water," Bilott said. "That's something we've been advocating that the agencies do for 15 or 16 years."

PHOTO

Rob Bilott, an Ohio attorney, has spent the last 15 years suing DuPont and has won blood testing and health studies for some 69,000 residents in the Mid-Ohio Valley. He says he hopes the successes of his case can be replicated in places like Bucks and Montgomery County.

Courtesy of Rob Bilott

Bilott also said blood test results were beneficial for residents.

"Blood data was extremely important and useful," Bilott said. "For example, if somebody had a diagnosis of cancer ... by looking at the blood levels and modeling them over time, they were able to know whether or not that person actually had (the chemicals) in their blood at, or prior to, the time they were diagnosed."

After the researchers completed their health studies, more than 3,500 residents filed personal injury claims against DuPont.

Two of Bilott's clients have each won jury awards eclipsing $1 million, and one received punitive damages as well. Several others have settled out of court. With thousands more to go, Bilott hopes to speed up the number of cases to 40 a year. But even at that pace, it would take nearly a century to resolve all the cases.

"It's certainly the plaintiffs' goal to get their cases heard and resolved as quickly as possible," Bilott said.

Others involved with the C8 Science Panel also acknowledge the double-edged sword that

resulted from the study. On one side, there's the semblance of an answer and the first trickles of justice as DuPont is found liable for the health effects PFOA caused. On the other hand, there's the long road ahead before either science or DuPont's reckoning are complete.

"We said six things (health conditions) are probably linked to PFOA, but we didn't have enough data to be sure," said Kyle Steenland, an epidemiology professor at Emory University and one of the three primary researchers on the C8 Science Panel. "The only way epidemiology works is by getting more and more studies until you get a weight of evidence."

For the purposes of the lawsuit, the researchers studied 55 possible health effects and concluded that with six, it was "more probable than not," that they were caused by PFOA, Steenland said. That's enough for the court, but it means future studies are needed to both confirm the C8 findings and to determine if it missed anything, or if random chance skewed the results.

Steenland said that without additional data, he's not confident in saying there are specific blood level thresholds where certain health effects start to occur. However, he pointed out, the median PFOA blood levels seen in Ohio and West Virginia are similar to Hoosick Falls -- between 20 and 25 ppb. A typical person at Pease had less than half of that, but about 150 people still had blood levels comparable to those in the other areas.

"I would argue that blood levels are informative because you, in fact, can compare them to other situations," Steenland said.

Dr. Paul Brooks, an Ohio physician who became one of the leading community activists pressuring DuPont, agreed blood tests help people determine if their health may be at risk.

"Once the people know their drinking water (has been cleansed) they have a sense of security. Well, you're not secure at all; you have to go for blood tests," Brooks said, adding that it takes several years for the amount of the chemicals in the blood to decrease by half.

Rob Allen said Hoosick Falls residents now are looking for follow-up testing for that exact reason, although it was a struggle just to get the tests approved the first time around.

"All we have is a baseline and we don't actually know if our numbers are going to go down, so we need another round or another couple rounds," Allen said. "And, again, use that data to help other people figure out what's going to happen with this."

Allen and several scientists with whom this news organization spoke noted that blood testing data for exposed communities also could prove useful for future studies.

"Often times, looking at one individual town or small community, it's difficult to have enough people for a health study to really get the statistical power to see a difference, especially for diseases that are a little more rare," Schaider said. "So to be able to combine results from multiple communities would be helpful, but you need to have consistency when the information is collected."

Bruce Alexander, a University of Minnesota environmental health sciences professor who has conducted health studies on people exposed to PFOS, said blood testing is useful even if no further studies are done, as it can help determine if exposure has occurred and evaluate the

effectiveness of cleanup operations. He points to a situation near a 3M facility in Minnesota, where blood tests were used to determine exposures to the chemicals had been stopped.

“The Minnesota Department of Health implemented a biomonitoring program that showed the filters installed to remove PFCs were working to reduce the blood levels in the affected community,” Alexander said. “Assessing the (blood levels) of the population is probably the best way to monitor the potential exposure to PFCs.”

What about Bucks and Montco?

As many as 100,000 residents of Bucks and Montgomery counties whose drinking water has been found to contain PFOS and PFOA are still without blood tests like those that took place in Hoosick Falls and Pease, or a large health study like the one in Ohio and West Virginia.

But it’s not for lack of trying.

Law firms already are attempting to replicate the successes that Bilott achieved and two, including New York City-based Weitz & Luxenberg, which is associated with Erin Brockovich, have sued the manufacturers who allegedly supplied firefighting foam to the military bases in this area.

Among the damages sought? Blood testing, continued screening for illnesses, and health studies to determine if blood levels can be linked to any diseases or health effects.

Williams Cuker Berezofsky, a center city Philadelphia firm, is suing the Navy in pursuit of the same.

Bilott, the Ohio lawyer, said he hopes the precedent set with the C8 Science Panel will carry over to communities like those in Bucks and Montgomery counties, and defendants will be forced to pay for comprehensive health studies.

But some local lawmakers and residents already have begun trying to find another entity to foot the bill for blood tests or health studies, and sidestep a protracted legal battle.

A collection of about a dozen politicians, including state representatives and senators, U.S. representatives and senators, and Gov. Tom Wolf, have written to the military, the EPA and the ATSDR, urging them to provide blood tests or a health study. Legislation has been proposed, but not passed.

Wolf’s office also looked at potential blood testing by the state Department of Health, but decided a "very conservative" estimate of $7 million to test about 35,000 people (about $200 a person) is beyond the state’s means.

“Pennsylvania is facing a structural deficit of upwards of $2 billion in 2016-17. We simply do not have the resources to commit to dedicating $7 million or more to blood testing,” Wolf wrote in a letter.

That $7-million estimate appears to be in line with others. While costs to test 69,000 people in Ohio and West Virginia reached $70 million about a decade ago, sampling costs appear to have come down since then.

Jake Leon, communications director with the New Hampshire Department of Health and Human Services, said the state split the costs of blood testing with the U.S. Centers for Disease Control and Prevention, and also benefited from a local hospital volunteering to perform blood withdrawals for free.

The CDC paid for the initial 700 blood tests, and the state paid about $180,000 for the next 900, Leon said. That amounts to about $200 per person, which is roughly the same as the estimate Wolf's office provided.

PHOTO

Hoosick Falls, New York, residents go through an interview process with the state Department of Health before having their blood tested for PFOA contamination in February 2016 at the HAYC3 Armory, a community center there.

Courtesy of Cindy Schultz/Times Union

Prices were higher for the 3,000 Hoosick area residents tested.

"The cost to the state, which includes retrofitting of equipment, phlebotomists, event staffing, data entry and dissemination is approximately $1,000 per test," the state's health department wrote in an email.

Additional funding for a health study using blood testing results from Pennsylvania would be another matter. Pease and New Hampshire haven't taken that step, but in Ohio and West Virginia, the price tag was a little over $30 million, Bilott said.

While the ATSDR initially pushed back on the idea of even testing residents' blood, the agency later agreed to support a health study following a meeting with U.S. Sen. Bob Casey, D-Scranton, this past summer.

“CDC/ATSDR is supportive of conducting a national-scale study of the health effects associated with community exposures to (the chemicals),” Taka Allende, a health communications specialist with the CDC, wrote to this news organization in October. “CDC/ATSDR is involved in ongoing discussions with the Department of Defense and state partners about a potential national health strategy for (the chemicals) that could involve … individuals from Pennsylvania.”

But like Pennsylvania government, the ATSDR said it doesn’t have the funds to complete such a study. According to Casey, the CDC estimated it could cost $20 million to $30 million, although Allende said that amount is subject to revision, based on how the study is designed.

“Neither the CDC nor ATSDR are currently funded to conduct a study of this scope," Allende said.

Even if a large study is funded and implemented, the ATSDR said it could take five to eight years to complete, similar to the timeframe for the C8 panel.

The legal value of such a study to any personal injury suits also would need to be determined. Unlike in the Mid-Ohio Valley, where DuPont was legally barred from contesting the results of

C8 Panel, defendants in any lawsuit here likely would be free to challenge the study's findings.

PHOTO Hans Pennink/for the Bucks County Courier Times

Hoosick Falls, New York, residents Rob Allen, left, and his wife Heather Allen, are concerned about PFOA contamination in their town's drinking water suspected to be from the Saint-Gobain Performance Plastics plant. Here, the couple and their children get ready to play in the yard of their home.

CHART: COTAMINATION COMPARISON

Sources: New York State Department of Health; City of Portsmouth; New Hampshire Department of Health and Human Services; C8 Science Panel and Attorney Rob Bilott; Horsham Air Guard Station; Pennsylvania Department of Health; U.S. Centers for Disease Control and Prevention.

PHOTO ESSAY Blood testing in Hoosick Falls, New York

Nov 6, 2016

Water in Hoosick Falls, New York, has been contaminated by PFOA, which studies have linked to a variety of ailments.

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